

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION:	§	EXAMINER: Unknown
S. Mark Haugland	§	
	§	
SERIAL NO.	§	GROUP ART UNIT: Unknown
	§	
FILED:	§	
	§	
FOR: METHOD OF ESTIMATING	§	
ELECTRICAL PARAMETERS OF	§	
AN EARTH FORMATION WITH	§	
A SIMPLIFIED MEASUREMENT	§	
DEVICE MODEL	§	

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

Pursuant to Applicant's duty, under 37 C.F.R. § 1.56, 1.97 and 1.98, to disclose all relevant material, the Applicant lists below the following references believed to be relevant to the subject matter of the above-identified application:

	<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor</u>
1.	3,944,910	03-16-1976	Rau
2.	4,185,238	01-22-1980	Huchital et al.
3.	4,209,247	06-24-1980	Urano et al.
4.	4,209,747	06-24-1980	Huchital
5.	4,780,679	10-25-1988	Kenyon et al.
6.	4,899,112	02-06-1990	Clark et al.
7.	4,968,940	11-06-1990	Clark et al.
8.	5,157,605	10-20-1992	Chandler et al.
9.	5,210,691	05-11-1993	Freedman et al.
10.	5,469,062	11-21-1995	Meyer, Jr.
11.	5,594,343	01-14-1997	Clark et al.

12.	5,675,147	10-07-1997	Ekstrom et al.
13.	5,867,806	01-02-1999	Strickland et al.
14.	5,869,968	02-09-1999	Brooks et al.
15.	5,881,973	03-16-1999	Agajanian et al.
16.	5,892,361	04-06-1999	Meyer, Jr. et al.
17.	5,963,036	10-05-1999	Wu et al.
18.	5,966,013	10-12-1999	Hagiwara
19.	6,047,240	04-04-2000	Barber et al.
20.	6,060,884	05-09-2000	Meyer, Jr. et al.
21.	6,092,024	07-18-2000	Wu
22.	6,211,678 B1	04-03-2001	Hagiwara
23.	6,216,090 B1	04-10-2001	Hagiwara
24.	6,218,841 B1	04-17-2001	Wu
25.	6,344,746 B1	02-05-2002	Chundurur et al.
26.	6,366,858 B1	04-02-2002	Haugland
27.	6,385,545 B1	05-07-2002	Wu
28.	2003/0163258 A1	08-28-2003	Haugland

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1. Dielectric-Independent 2-MHz Propagation Resistivities, Peter T. Wu, John R. Lovell, Brian Clark, Stephen D. Bonner and Jacques R. Tabanou, Society of Petroleum Engineers, Inc. SPE 56448, 19 pages (1999).
2. New Developments in 2- MHz Electromagnetic Wave Resistivity Measurements, S. Gianzero, G. A. Merchant, M. Haugland and R. Strickland, SPWLA 35th Annual Logging Symposium, pp. 1-25 (June 19-22, 1994).

3. Vertical Deconvolution of 2 MHz Propagation Tools, Richard Rosthal, David Allen and Stephen Bonner, SPWLA 34th Annual Logging Symposium (June 13-16, 1993).
4. *Geometric Factor and Adaptive Deconvolution of MWD-PWR Tools*, Q. Zhou, D. J. Hilliker and D. Norwood, The Log Analyst, pp. 390-398 (July-August, 1992).
5. *Reconciling Differences in Depth of Investigation Between 2- MHz Phase Shift and Attenuation Resistivity Measurements*, Tarek Habashy and Barbara Anderson, SPWLA 32nd Annual Logging Symposium, pp. 1-20 (June 16-19, 1991).
6. *Complex Variables and Applications 5th Ed.*, Ruel V. Churchill and James Ware Brown, 2 cover pages and pp. 48-50 (1990).
7. *Waves and Fields In Inhomogeneous Media, Transients*, Weng Cho Chew, 2 cover pages, pp. 244-246, 360-365 and 485-487 (1990).
8. *Algorithm 624: Triangulation and Interpolation at Arbitrarily Distributed Points In the Plane*, Robert J. Renka, ACM Transaction on Mathematical Software, Vol. 10, pp. 440-442 (December 4, 1984).
9. *A Triangle-Based  $C^1$  Interpolation Method*, R. J. Renka and A. K. Cline, rocky Mountain Journal of Mathematics, Vol. 14, No. 1, pp. 223-237 (Winter 1984).
10. *Geophysics, A Journal of General and Applied Geophysics*, Published by The Society of Exploration Geophysicists, Vol. XXVII, No. 6, Part 1, cover page and pp. 828-858 (December 1962).
11. MORAN, J. H. and CHEMALI, R. E., *More on the Laterolog Device*, Geophysical Prospecting 27, pp. 902-930 (1979).

12. *Effect of Tool Eccentricity on Some Electrical Well-Logging Tools*, John R. Lovell and Weng Cho Chew, IEEE Transactions on Geoscience and Remote Sensing, Vol. 28, No. 1, pp. 127-136 (January 1990).
13. BADEA, EUGENE A. and EVERETT, MARK E., *3-D Finite Element Analysis of Induction Logging*, 4 pages (date unknown).
14. *Fundamental Analysis of Remote-Field Eddy-Current Effect*, IEEE Transactions on Magnetism, Vol. 32, No. 4, pp. 3195-3211 (July 1996).
15. *Numerical Recipes, The Art of Scientific Computing*, © Cambridge Press 1986 and © Numerical Recipes Software, 2 cover pages, pp. 52-65 and 520-527 (1986).
16. *NAG Fortran Library Manual Mark 18*, © The Numerical Algorithms Group Limited, Vol. 4, D04-4E04L cover pages and pp. E04.1 – E04.16 and 1-6 (September 1997).
17. *New Discovery with Important Implications of LWD Propagation Resistivity Processing and Interpretation*, S. Mark Haugland, SPWLA 42nd Annual Logging Symposium, pp. 1-14 (June 17-20, 2001).
18. *Handbook of Electromagnetic Materials, Monolithic and Composite Versions and Their Applications*, Perambur S. Neelakanta, PhD., C.Eng., © 1995 by CRC Press, Inc., cover pages and p. 46.
19. *Estimation Of Water Content and Porosity Using Combined Radar and Geoelectrical Measurements*, Grit Dannowski and Ugur Yaramanci, Technical University of Berlin, Dept. of Applied Geophysics, July 28, 1999.
20. *Comparisons of Wireline and LWD Resistivity Highlight Resistivity Frequency Dispersion In Sedimentary Formations*, Roland Chemali,

Dale Heysee, G. A. Merchang, Charles Jackson, SPWLA 36th Annual Logging Symposium, pp. 1-12 (June 26-29, 1995).

21. *In-situ Measurement of Resistivity Dispersions (or lack of it) Using MWD Propagation Resistivity Tools*, W. Hal Meyer, SPWLA 40<sup>th</sup> Annual Logging Symposium, pp. 1-14, (May 30 – June 3, 1999).

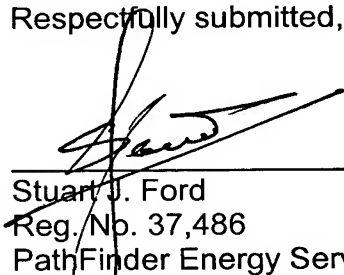
Applicant respectfully submits that the invention in the above-identified application is patentably distinguishable over the cited references known to Applicant and disclosed in the above Information Disclosure Statement.

This Information Disclosure Statement is being filed **within** three months of the filing date of this national application or the date of entry of the national stage as set forth in § 1.491 in an international application.

Respectfully submitted,

Date:

Sept 26, 2003

  
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--Applicant--

Substitute for form 1449A/PTO				<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>				Application Number	
				Filing Date	
				First Named Inventor	
				Art Unit	
				Examiner Name	
Sheet	1	of	2	Attorney Docket Number	PAT009CON

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code (if known)				
	AA	US-	3,944,910	03-16-1976	Rau	
	AB	US-	4,185,238	01-22-1980	Huchital et al.	
	AC	US-	4,209,247	06-24-1980	Urano et al.	
	AD	US-	4,209,747	06-24-1980	Huchital	
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	AH	US-	5,157,605	10-20-1992	Chandler et al.	
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	AJ	US-	5,210,691	05-11-1993	Freedman et al.	
	AK	US-	5,469,062	11-21-1995	Meyer, Jr.	
	AL	US-	5,675,147	10-07-1997	Ekstrom et al.	
	AM	US-	5,867,806	01-02-1999	Strickland et al.	
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	AY	US-	6,344,746 B1	02-05-2002	Chunduru et al.	
	AZ	US-	6,366,858 B1	04-02-2002	Haugland	
	AAA	US-	6,385,545 B1	05-07-2002	Wu	
	AAB	US-	2003/0163258 A1	08-28-2003	Haugland	

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		Country Code-Number-Kind Code				

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>1</sup>	
	AAC	Dielectric-Independent 2-MHz Propagation Resistivities, Peter T. Wu, John R. Lovell, Brian Clark, Stephen D. Bonner and Jacques R. Tabanou, Society of Petroleum Engineers, Inc. SPE 56448, 19 pages (1999).		
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Examiner Signature	Date Considered
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.  
<sup>1</sup>Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				<b>Complete if Known</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td style="width: 50%;"></td> </tr> <tr> <td>Filing Date</td> <td></td> </tr> <tr> <td>First Named Inventor</td> <td>S. Mark Haugland</td> </tr> <tr> <td>Art Unit</td> <td></td> </tr> <tr> <td>Examiner Name</td> <td></td> </tr> <tr> <td>Attorney Docket Number</td> <td>PAT022US</td> </tr> </table>		Application Number		Filing Date		First Named Inventor	S. Mark Haugland	Art Unit		Examiner Name		Attorney Docket Number	PAT022US
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